Student Name:

Modeling Population Size

You have learned about how to sample a population and estimate size from density. In this activity, you will: construct a model of a population, sample the population to determine its density, then use its density to determine its size.

Part One: Construct the Model

Materials

       1 piece of 8.5 by 11 in. letter paper

       1 pen or pencil

       1 ruler

       50 small dry beans or other small objects such as buttons

       1 small cup

Directions:

1) Use your pen or pencil and ruler to divide the paper into four equal sections.
2) Place the 50 beans into a small cup.
3) Scatter the beans as evenly as possible over the entire paper, making sure to get some of the beans into each section.

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Part Two: Use the Model to Estimate the Size of the Population

In your model, each bean represents a starfish and the paper represents its ocean floor habitat.

1) Within the habitat, choose one of the four sections and count the number of starfish in that section.

2) Use your ruler to measure the dimensions of the section you chose and calculate the area that you sampled.

3) Calculate population density based on your sample.

4) Use your ruler to measure the dimensions of the entire habitat and calculate the total habitat area.

5) Use your calculated population density and total area to estimate total population size.

6) Compare this estimation to your known population size (50). Did you under- or overestimate based on your sample?